nuance

"...a shade of difference"

Special Commemorative Issue:

John K. Northrop

NORTHROP UNIVERSITY • WINTER 81

"I never once made a discovery...I speak
without exaggeration when I say that I have
constructed three thousand different theories
in connection with the electric light..."

Thomas A. Edison

Behind the Discovery

Pioneers have a way of making years of exploration
seem like an instant discovery. Out of the blue, John Northrop discovered
he could make paper airplanes fly without tail or fuselage-
as pure wings. And at that moment-
he turned the century's attention to aerospace.
For twenty years, he worked on his pure Flying Wing and proved that discovery
demands a continuous disagreement with the status quo.
Motivated not just to learn, but to make learning work,
Jack Northrop wrestled with magnesium and heliarc welding
to develop the lightest, cleanest aircraft possible.
His education was not something he was handed, or was "given."
The really memorable part of his learning was what he went out
and found. More than vision and skill,
John Northrop realized the years of stubborn perseverence
that it takes to make an idea fly.

Michelle O'Daniel
Editor

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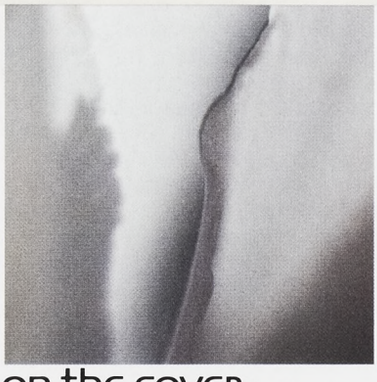

on the cover:

Photography by Carol Vitz. The close-up image of a white geranium was captured with a 35mm camera, macro lens and extension rings. Milton Caniff did the line drawing of Jack Northrop.

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In determining how best to exploit and protect a new discovery, the owner of an invention is faced today with the complex problem of whether or not to reveal his discovery in exchange for the protection of a patent, or choose to treat it as a trade secret and rely on state laws which offer various means of protection. The protection a patent offers is really nothing more than the right to use our courts to exclude others from the making, using or selling of the invention covered by the patent. Protecting a trade secret is more complex, involving matters of contract law, or the law of torts, and in the case of theft and the like criminal law. It is the purpose of this article to examine the advantages and disadvantages of both means of protection. It will be observed that the matters to be considered on whether to "patent or padlock"[1] are not simply legal, but involve business acumen and technological considerations as well.

Illustration by Becky E. Beneway

The Dilemma Of Invention:

To Patent Or Padlock

by Leonard A. Chudacoff
Northrop University School of Law, Technology Management

Let me commence with some general observations concerning patents and trade secrets. A patent is a federal grant; a privilege to use our courts to prevent others from infringing the patent. The bargaining power of the patentee is his ability to enforce his right of exclusion by means of infringement suits, or the threat of infringement suits. A patent is not, accurately speaking, a monopoly, for it is not created by the sovereign at the expense and prejudice of the community; it does not give an exclusive privilege over a thing which the public freely enjoyed prior to the grant. A monopoly, in that sense, takes something from the people. The grant of a patent deprives the public of nothing it enjoyed prior to the discovery, but gives something of value to the community.

On the other hand, the owner of an unpatented trade secret does not have an exclusive right; he has a property right in the secret only so long as he does not disclose it. He may exercise his property right by disclosing his secret subject to such conditions as its remunerative use and further non-disclosure. Any person who obtains the secret from the owner by theft, bribery, stealth, breach of a confidential relationship or other unlawful means violates the property right of the owner and is subject to a contractual limitation or restriction as to its use. If the secret is used beyond the scope of the rights contracted, then the user may be liable for an action for breach of contract.[2] But, to repeat, if the acquisition by the second owner of the trade secret has been wholly innocent and without contractual restraints, then the first owner has no rights whatsoever in respect to what the second owner may do, including full publication of the secret making it part of the public domain.

It should be clear that there is no decision-making when the invention is such that its physical embodiment reveals everything to the observer or its composition may be easily recognized through the process of "reverse engineering." Here there is little choice but to go to the "patent route." On the other hand, a discovery, say a highly efficient process for the splicing of genes, is deservedly the subject of decision-making on the issue of "patenting or padlocking." It is in respect to the latter kind of invention that this discussion is centered.

To further complicate matters, the decision to patent is not, in most cases, a complete release from trade secret concerns. Even though our patent laws require a patent specification that not only contains a written description of the invention, but also the manner of making and using it "in such full, clear, concise and exact terms as to enable any person skilled in the art to which it pertains...to make and use the same,"[3] it is virtually impossible for a patent to disclose all of the engineering details for all uses of the inventive concept. Furthermore, there are the thousands of hours of research and development it took to turn the invention into marketable technology. The know-how involved in the usage and marketing of the invention is not patentable but is the proper subject of trade secrecy protection. Licensing the patent will in most cases, also involve licensing the know-how.

Some of the factors to be considered in making the decision on which path to follow are as follows:

1. There is usually a long delay in obtaining a patent - two to five years following application. Applicants, usually as a result of company policy or upon advice of their patent lawyer, tend to make their claims overly broad. If the Patent Office finds any of the claims to have been fully anticipated by the earlier developments in the art, it will reject the entire application, although most of the claims may be patentable, forcing the application to be submitted anew. This whole procedure may be repeated with amended applications until the Patent Office finally concludes that some claims are patentable or issues a final rejection.

2. Challenges to patents in our courts of appeal have resulted in the courts finding approximately seventy five percent (75%) of those challenged to be invalid or unenforceable.

3. Enforcement of a patent against an infringer is extremely time consuming and is easily the most expensive form of litigation in the entire business law spectrum, even outdistancing antitrust litigation.[4] A patentee of limited financial means may find himself practically incapable of enforcing his patent against an infringer with a deep pocket. The expenses of litigation, including the hours of discovery, expert witnesses, appeals and the like, have forced more than one owner of a valid, enforceable patent to throw in the towel, accepting compromise due to his inability to continue the fight.

4. In respect to the foreign owner of a patentable discovery, award of a patent automatically subjects the owner to the jursidiction of our courts and service of process in respect to proceedings affecting the patent or rights under it.[5] If the foreign owner prefers to go the trade secret route, plaintiffs in this country may be faced with a host of obstacles in obtaining jurisdiction over the owner.

5. At one time, as a matter of contract law, a licensee under a licensing contract could not deny the validity of his licensor's patent in a suit for royalties under the contract. Now, by virtue of an opinion handed down by our Supreme Court in 1969,[6] a licensee may well profit from an agreement for several years but, upon finding this no longer to be the case and his obligations having become onerous, may turn and attack the source of his earlier financial gains by challenging the validity of his licensor's patent.

6. Applicants for letters patent must conduct themselves with the utmost of candor in their dealings with the Patent Office. If it can be shown that a patent was procured by fraud, the treble damage provisions of our antitrust laws may be available to the injured party.[7] Even though a patentee may have done everything in his power to be as honest and forthright as possible with the Patent Office, the danger may still linger on, that an infringer, in examining the patent file, will find some discrepancy enabling him to charge there was a fraud perpetrated, thus possibly permitting the infringer to counter claim against the patentee on the basis of an antitrust violation.

7. Under the doctrine of patent misuse, a patentee's right to use our courts to enforce his patent against infringers is suspended until the misuse has ceased and its effects have been totally dissipated. Activities which constitute misuse are in most cases incipient antitrust violations. The theory underlying the doctrine is that the courts have for their purpose the dispensing of justice unalloyed with anything base, and "no polluted hand shall touch the pure fountain of justice." If a patentee has been guilty of any evil practice in respect to his patent, such as using the patent as a kind of lever to obtain special privileges concerning matters without the scope of his patent, his hands are "unclean" and a court will deny him its aid in preventing patent infringement.

8. If the owner of the patent decides to do nothing with his patent except sue alleged infringers, he might find that he has a so-called "paper patent" which is an excuse for a number of courts to narrowly construe the scope of its claims.

9. Throughout years of litigation involving patentees and the Antitrust Division of the Department of Justice, as well as private litigants, the rights of patentees have been slowly eroded. Here are some examples of the limitations this litigation has produced by way of court opinion:

i. Price restrictions. Although it would seem reasonable for a patentee to want to protect his own pricing structure upon licensing another to sell his licensed products by insisting that he not be under-priced by the competitor he creates, to try to set prices of the licensee in today's climate is a dangerous move. Antitrust advocates claim it is price fixing between competitors and as such violative of the Sherman Act.

ii. Field of use restrictions. This is to divide licensees on the basis of the use to which they put the patented product, because the economics of different uses are such that differing royalties can be achieved, resulting in profit maximizing to the patentee. If, on the other hand, two or more competitors should pool their patents and divide their possible applications between themselves, this would, by itself, violate the antitrust laws. The Department of Justice is opposed to field of use limitations of any kind.

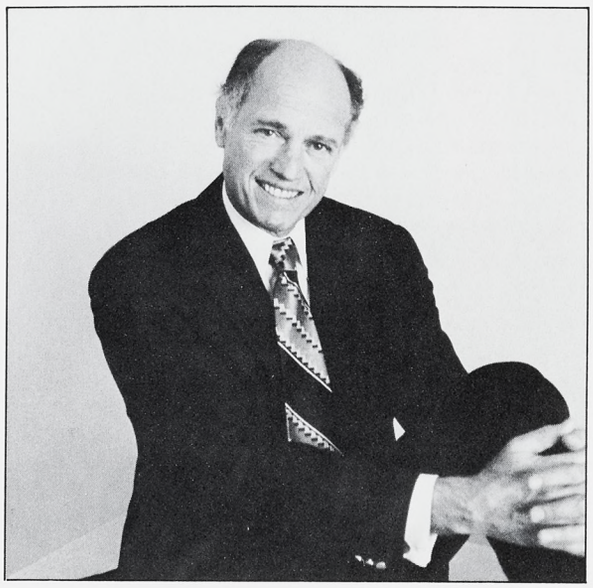
iii. Territorial allocation. Our patent laws specifically allow the licensing of rights to a whole or specified parts of the United States.[8] However, territorial allocations, if part of an aggregate of restraints, can well lead to difficulties.

iv. Grant back requirements. Although it would appear that the patent is a transferable thing, subject to being bought, sold and licensed for whatever can be gotten, to license its use in exchange for the return or grant back of all improvement patents of the licensee is something also to which our Department of Justice is opposed.

10. The licensing of trade secrets, in view of the antitrust laws, brings with it its own unique set of problems. Here are some considerations:

i. Generally, the licensing of a trade secret with restrictions upon the time, place or manner of such use should be done without fear of violating the antitrust laws. This is so because the license itself is a partial release of the monopoly position of the trade secret owner, rather than the imposition of additional restraints upon trade and commerce.[9]

(continued on page 20)



Leonard Chudacoff, Professor of Law at Northrop University, was educated in the United States, Germany and Switzerland with particular concentration in Licensing, Anti-trust Laws, and International Transactions. He has published over two dozen papers in these fields which are considered part of Technology Management.

John K. Northrop: Aviation Pioneer
Designer of Wings
1895 - 1981

From the delicate wood and wire biplanes to supersonic jets, Jack Northrop has seen the full spectrum of aviation in his eighty-five years. Most of the structural innovations that have made larger and faster planes possible, were introduced by Northrop. As a pioneer member of the first group of aircraft engineers, he developed the concept of a light-weight multicellular wing, as well as the revolution from wood to metal stressed-skin aircraft which are two of the fundamental bases for large commercial aircraft.

From the time he was thirteen, Northrop has been fascinated with the ability to fly. Just a few years after the Wright brothers got their plane off the ground, Northrop saw a French aviator assemble and fly a pusher biplane around Santa Barbara. From then on, he knew he had to make a career in aviation.

Those were the "golden years of aviation," as he called them, when all the aviation greats gathered at a California airmeet. It was easy to see Larry Bell, who would later start Bell Helicopters, talking to Glenn Martin of Martin Aircraft, along with Glenn Curtiss of Curtiss Airplane Motor Company. The time was the 1920's and the place was California. Jack Northrop, just barely twenty years old, caught the spirit of the times and made himself a familiar sight at the Lockheed brothers company in Santa Barbara. "I made a nuisance of myself," Northrop said, "until they gave me a job." He would start with his favorite subject, the wings for the company's seaplane.

To say that Jack Northrop began with only the experience of a garage mechanic or "grease monkey", as he called himself, is only to emphasize that there were no aircraft technicians when Northrop began. The science of aeronautical design had yet to be developed. But Jack Northrop was known for his futuristic ideas. Always designing and re-designing, he searched for new solutions and became known as "the man ahead of his time." In order to use a light-weight magnesium for aircraft, he developed a new welding system. After studying wing stresses, he developed a wing which needed no external support system of struts and braces, and which, he happily reported, "didn't come off either." He is also credited with the basic breakthrough in aircraft manueverability, the ailerons, or ground spoilers, which aid in rapid take-off and landing.

But Jack Northrop had one perpetual obsession: to design the most aerodynamically sound and fuel-efficient aircraft with as little drag and as much lift as possible. He worked alone after hours at his drawing board to accomplish just that single purpose. Twenty years later, the world would see the results in the XB-49 bombers popularly known as the Flying Wing. A new concept in aircraft design, with no fuselage and no tail, the Flying Wing was all lift and no drag, capable of carrying a payload equal almost to its own weight and traveling at speeds in the 500 m.p.h. range. In the late forties, it was the aircraft with the longest flight range in the world.

What was undreamt of in previous technologies, the quiet man, John Northrop made a practical feat. He revolutionized the concept of flight with his design of the Lockheed Vega in 1928 which went on the establish a new transcontinental speed record for coast to coast flight. Flown by Wiley Post, Amelia Earhart, Charles Lindbergh and pilots of the Antarctic Expedition, the Vega with its new cantilever (self-supporting) wing design, and a streamlined fuselage of all one piece, became the fastest and cleanest airplane of its time.

Northrop's famous P-61 "Black Widow" was the first true night fighter built and contributed immensely to the victory of the Allies in World War II, bringing Northrop himself, a Presidential Certificate of Merit in 1947.

He also received the recognition of membership in the International Aerospace Hall of Fame in 1972 and the Aviation Hall of Fame in 1974. Currently, he is being featured in a display of his life's accomplishments at the Smithsonian Air and Space Museum in Washington D.C.

No ivory tower inventor, Jack Northrop also pioneered a new style of management. His door was always open to anyone who needed to talk. Apparently, this sensitivity and compassion for others motivated him to transfer some of his aeronautical designs to the field of prosthetic devices for the many disabled veterans. He developed a much more manueverable artificial hand which could grasp small objects in an accurate, pincher-type movement and permitted the disabled veteran to work as a skilled technician.

Jack Northrop was never satisfied with an idea until he could make it work. To say he lived with his head in the clouds for the last half century is probably literally true since as Donald Douglas Sr. once commented about his friend, "Every airplane in the sky has some of Jack Northrop in it."

Most people know about the achievements of Jack Northrop: the Alpha, the Beta, the Gamma, the Flying Wing; but few have heard the story as he tells it. The following has become an historic record of the career of John K. Northrop, presented as he told it in 1972 at a dinner interview sponsored by Northrop University.

(continued)

Editor's Note: As this issue of Nuance went to press, John K. Northrop died on February 18, 1981.

In The Words Of John K. Northrop

1916: At twenty-one, Jack Northrop began as a draftsman engineer for the Lockheed brothers in Santa Barbara, California.

"**And so, having aviation deeply in my heart,** when the Lockheed brothers came to Santa Barbara and started flying there and took on the job of building a twin engine seven or eight passenger flying boat, there wasn't anything I could do but go down and see if I could get a job, and I did.

I had a little experience as a garage mechanic and I worked for a year as a draftsman for an architect...and this sort of qualified me to design airplanes, you can understand...in those days.

I designed quite a bit of the Lockheed twin engine flying boat, calculating wing stresses, and they never came off!

Later I had the pleasure, after the Lockheed operation in Santa Barbara folded for lack of business and finances in 1923, to work for Doug (Donald Douglas) and had the opportunity of helping in the design of the world cruisers and a number of airplanes that followed them."

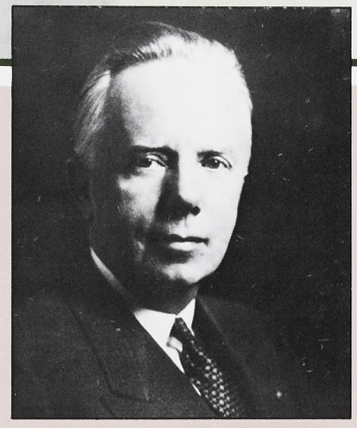
1923: His first assignment at Douglas Aircraft was to design the fuel tanks for the famous Army Air Service 'Round the World Cruiser'. It was after hours that he developed the concept for an all-wing aircraft which would take twenty years to perfect into the XB-49 bombers...

Well, George Stompl, who was the shop man at Douglas really saved my life and the life of my family, too. We were broke and hungry and I had to have a job. So when I went to Santa Monica, I was hired in the wood shop and started in the actual manufacturing of the truss type wood ribs that were used in those days. However, I had a little recommendation from Alan Lockheed - I think he talked to Doug about giving me a chance in the Engineering Department. The opportunity came two weeks later.

So, the morning that I was supposed to report there, I went in trembling with my knees knocking together, I can assure you. And the first job they gave me was the designing of the fairing on this particular world cruiser airplane. It had a steel tube type of fuselage and I was to design the fairing for this fuselage.

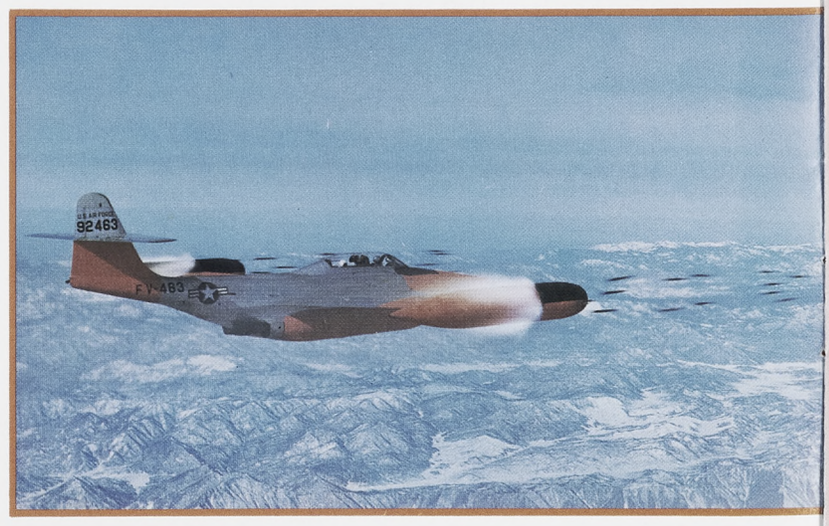
However, my work at Lockheed had been largely in wood and monocoque wood, so I didn't know a doggone thing about putting a fairing on a steel tube fuselage. I was absolutely petrified. Along came noon and I managed to gobble down a little lunch and this made me so ill that I went home. Next morning I approached the job again, not knowing whether I was going to last through the morning or not, but fortunately somebody else had been started on the fairing and I got a job designing aluminum gas tanks...and this I knew how to do."

1.



2.

Photos: 1. The Black Widow night fighters are credited with having virtually eliminated mass night bombing attacks in both the European and Pacific theatres. 2. John K. Northrop 3. The Gamma (1933) was used to pioneer stratosphere flying and to take off in storms that grounded other air transports. Custom-made, this Gamma was flown by Lincoln Ellsworth on his Antarctic Expedition. 4. With a wing span of 172 feet and weighing 209,000 pounds fully loaded, the Flying Wing was able to attain speeds of 500 m.p.h. And, as Jack Northrop explained it, remains " as a monument to what can be done."



Jack Northrop's final major design effort, the F-89 Scorpion was also one of his most productive military designs. Developed as the modern successor to the P-61 Black Widow, the Scorpion was able to operate in harsh, all weather conditions, during low visibility and at night. It was the first airplane ever to fire an air-to-air nuclear weapon. The F-89 D, shown here, could fire 104 aircraft rockets (52 in each of the wing pods) in clusters covering an area the size of a football field. The Scorpion was the world's most heavily armed fighter of the mid-fifties and was used in great numbers by the Air Force during the Korean War.

3. Illustration by Mitchell Crawley

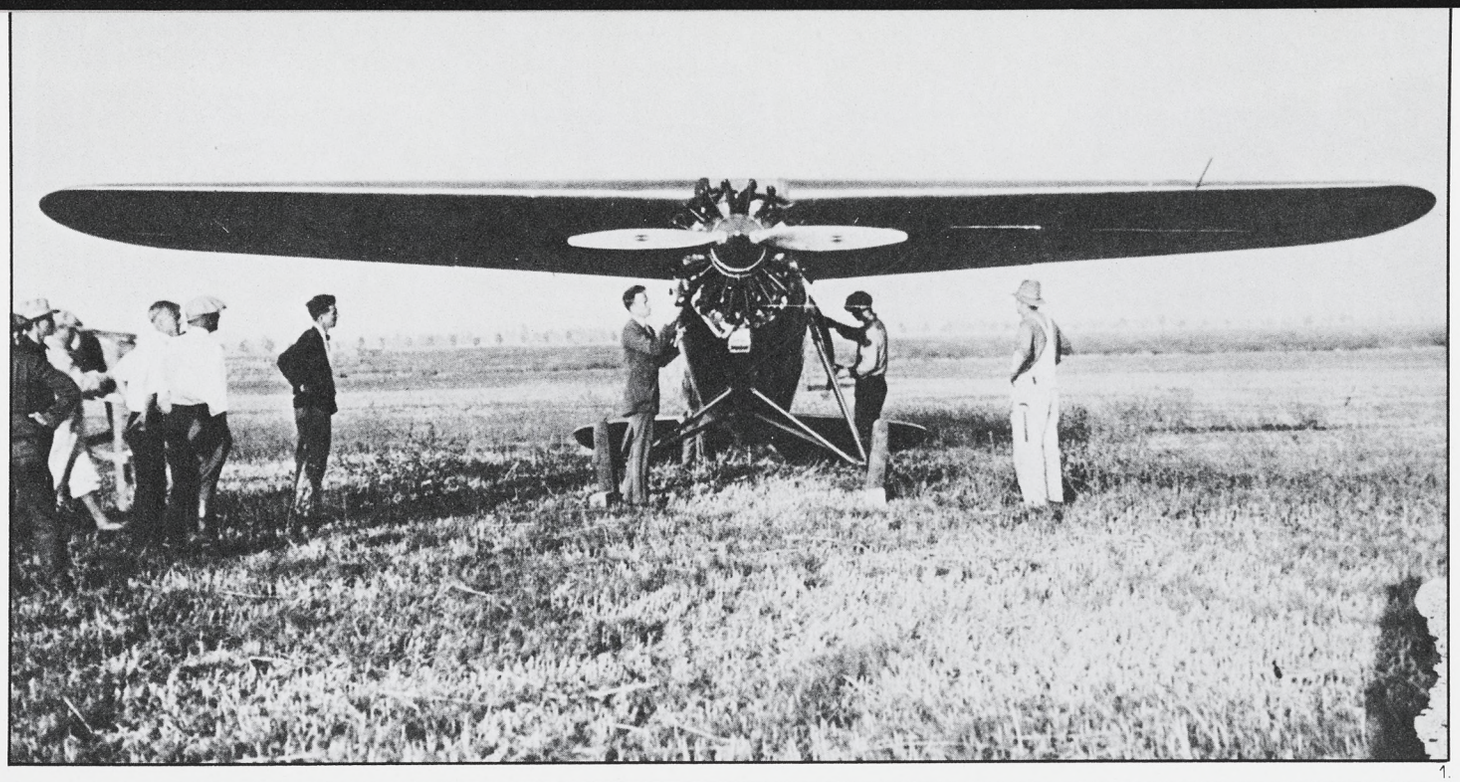
Donald Douglas remembers the lean beginning years:

"Jack Northrop, you know, when he came to work for me had no automobile. I was just about wearing out an old car which was called an Elgin - which I doubt anybody remembers. So I said, 'Jack, I think I can buy a new car and you can have this old junk of mine, if you think you can make it run.' He did."

In the early years of aviation no one ever discouraged experimentation. Anything was encouraged which could lead to a better aircraft:

"We had many dealings with the Government during the World War II period and we had the happiest type of relationship with the people we dealt with. There was ordinarily a competent, friendly, brilliant officer assigned to a particular project, and if you had problems you could get on the phone to Wright Field and get an answer, if not immediately, within hours. The result was a tremendous production in a very short period of time and a heck of a lot of very fine planes. It was before the computer era. it was before the growth of giant corporations where every decision is made by a committee. We were never told 'You can't do this or don't experiment with that'. Everything we did was aimed at making a better aircraft and we had a lot of successes. Aircraft designing will never be that way again." (continued)

4.



1.

The ingenuity of three men produced the Lockheed Vega. Northrop designed it; Tony Stadlman built it and Lockheed sold real estate to finance it...

"I got acquainted with a chap by the name of Fred Keeler who was an industrialist in Los Angeles. He had quite a diversified operation and Jack made us a three-view drawing and the estimate of performance; and fortunately, Fred Keeler had a chap who was doing his bookeeping. But Jack Northrop really designed it. Right down in the heart of Hollywood, we built the first Lockheed Vega on Sycamore behind the Hancock properties just south of Santa Monica Boulevard."

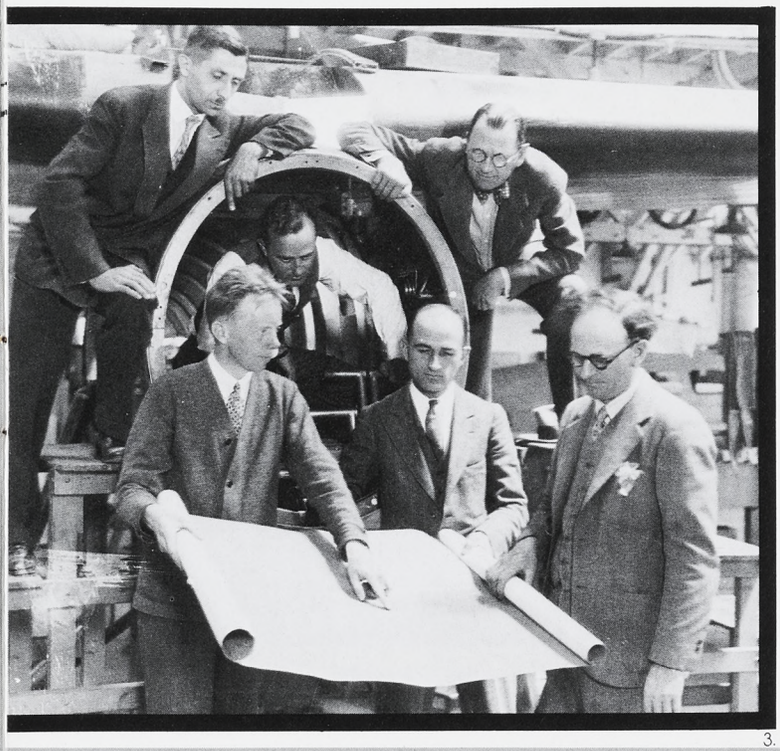
Allan Lockheed

2.

The early objective of aircraft design was to clean it up and simplify the lines...

"The whole objective was to build as clean an airplane as we could possibly conceive in those days. The average airplane has struts and wires or fuselage forms that weren't as smooth or streamlined-with as low a drag as possible. It was pretty obvious, it seemed to me, that a full cantilever wing neatly faired to a perfectly streamlined fuselage would take less power to do the job than some other types. So, it was a breakthrough in that we went wholeheartedly into as clean an airplane as we could.

I remember one very strong argument that I had during the design period with regard to putting a strut on the cantilever wing. Whoever it was that was arguing with me said, 'Nobody will buy it. Nobody will fly it; you can't possibly sell an airplane without a strut to support the wings.' But it turned out to be a great concept to reduce the power wasted to a minimum."



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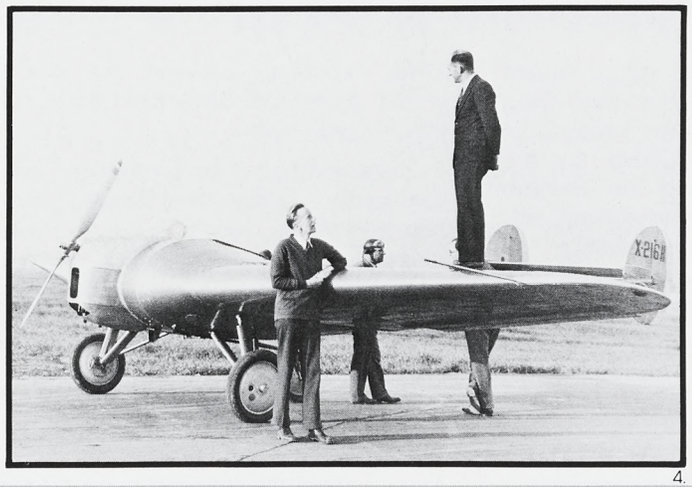

4.

5.

The major revolution in aircraft design came with the introduction of metal sheets instead of wood panels...

"You realize in the late twenties and early thirties, there was a rather major revolution from wood to metal or from cloth to metal, and we were pioneers in connection with that work.

In those days, if you analyzed the load that a thin sheet would carry without buckling, it was negligible, and just appeared impossible to use the sheet covering for any structural members. We had a problem of designing a horizontal tail surface that was a perfectly rectangular piece. It wasn't heavily loaded and it occurred to us to build a little test section and see what it would do, just to check the buckling, stress analysis and so forth. Well, this particular experiment came out so well, I think the part held some ten times as much as it was supposed to. It also held a high percentage of the bending load as it had started to buckle. This was a pure happenstance, and a lucky happenstance that enabled us to proceed with the monocoque metal structure that came into use so well after that.

We had a story, I think it's true, about one of the early airmail pilots who was forced into a restricted field and had to ground loop the airplane very violently in order to keep from going into a hill, or trees, and he bent the wing up at about forty-five degrees. They sent a crew out from Kansas City, where the plane was based, and bent the wing down with some block and tackle and flew it back in for more permanent repairs!

It just indicated the toughness and resiliency and strength that exists in these metal structures. They are usable still, a very great deal, even after they're overloaded. It's something in the strut or fitting that gives it a reserve toughness.

The friendships made in the early days of aviation between Douglas, Lockheed and Northrop would last for their life times...

Well, the most rewarding experience happened the day in Don Douglas' office where the general manager and chief salesman and chief engineer along with four or five of the engineering department were there, and Doug had gone East to try to get an order for a number of additional airplanes. We were all there with our fingers crossed-probably eight or ten of us in the office. Doug sent a telegram, and he said, "Let all engineers go except Mankey and Northrop". That moment was one of the most satisfying of my life.

Oh, I think the people who were working in the aviation industry then loved it. They wouldn't have been in it if they hadn't, don't you think?"

Photos: 1. The first Lockheed Vega was called, the "Golden Eagle," at Mines Field, California in 1927. 2. Sir Hubert Wilkins, famous Arctic explorer, looks at wing structure of Lockheed Vega built for him in 1928 by Jack Northrop (right). 3. Lockheed personnel, in early 1928 (from left to right) Tony Stadlman, design engineer, John K. Northrop, design engineer, Jerry Vultee, Kenneth Jay, financier-newspaper man, and Lockheed (furthest right). 4. John K. Northrop with the first airplane built under his own name, the Northrop AVION, a miniature flying wing. Kenneth Jay, Northrop financier, is standing on the wing, and Eddie Bellande, famous test pilot and later President of Garrett Aircraft Corporation is ready for take-off. 5. Life-long friends, Donald Douglas and John K. Northrop (right), exchange memories at Northrop University.

This unique oil painting of Northrop's Flying Wing bomber by the British painter, Douglas Ettridge, was commissioned by Northrop University to commemorate the life-time dream of Jack Northrop.

Whatever Happened to the Flying Wing?

Hailed as the fastest, most efficient aircraft of its time, the first pure wing airplane to be designed took twenty years to perfect. The Air Force designated it as the replacement for the World War II B-29 bombers and it had the aeronautical distinction of being the first aircraft capable of carrying a payload nearly equivalent to its own weight. It was an aviator's dream come true. Without a tail or fuselage, the pure flying wing was all lift and no drag. Weighing close to 200,000 pounds when fully loaded, it was able to fly at 500 m.p.h. In January 1948, the Air Force declared it the aircraft with the longest range in the world. Then, suddenly, without explanation, the Flying Wing contract was cancelled and millions of dollars worth of test planes were destroyed. Rumors circulated for years about the probable reasons for such a dramatic and costly decision.

Today, thirty years later, Jack Northrop permitted the inside story to be released. In a taped interview given to reporter Clete Roberts, Northrop finally told the public that Air Force Secretary Stuart Symington had given him the ultimatum of merging his then fledgling Northrop Corporation with the larger Consolidated Vultee (later known as Convair and now as General Dynamics). When Northrop refused to give up his company, Symington apparently cancelled the Northrop government contract for the B-49 Flying Wing Bombers and awarded a contract for B-36 bombers to Convair.

Northrop also revealed why he kept silent for thirty years before explaining the destruction of the Flying Wing. He said he feared reprisals from Symington, in the form of a forced closure of Northrop Corporation. Symington, after retiring as Air Force Secretary, remained a powerful man in Washington, serving twenty four years in the U.S. Senate and remaining an influential member of both the Armed Services and the Foreign Relations Committee. According to Northrop, it was simply a decision to lose the company or his aircraft, and he opted for the latter.

From his hospital bed, Northrop watched the public respond to his announcement. He watched a taped program of his interview which revealed the thirty year old secret about the Flying Wing. Then, unable to speak, and partially crippled by strokes, the 85 year old aviation pioneer raised his hands in a gesture of victory. He had finally made known to the world what he felt was a lifelong injustice. For years, public opinion had held that the Flying Wing had been scrapped for reasons of control and stability problems. But, the Air Force had awarded the bomber contract to Northrop's Flying Wing only after years of strenuous testing. Its destruction remained an enigma until Northrop decided to reveal the politics behind the events.

The last of the big Flying Wings was scrapped in 1953, but Jack Northrop had retired in 1952, divesting himself of all interests in the company he started. His heart was with the Flying Wing. Encouraged by recent renewal of interest in the Flying Wing design by NASA, Northrop believed his plane would finally be developed for long range cargo flights.

"I'll be satisfied when somebody does something with the Flying Wing to prove how good it is." Northrop said in a **Los Angeles Times** interview when he was 83, "I think the only reason I'm still here in life is because I want to see something happen."

Today, crippled by Parkinson's disease and strokes, Northrop is still waiting for news about the interest in his Flying Wing. One of the first pioneers of aviation still believes his revolutionary aircraft design will be a model for future flight.

Ray Swanson
Artist of the Southwest

One of twelve leading American Artists whose paintings were selected as winners of the Franklin Mint Gold Medal Award for Distinguished Western Art, Ray Swanson never really dreamed of becoming a painter. At first, he thought he would follow in his father's footsteps and become a farmer. Then, a cousin convinced him to get an Aeronautical Engineering degree at Northrop University, which he did in 1960. **Shortly before graduation, he found his grandfather's oil paints and art supplies and knew he had found his talent. Today, he is known as one of the leading Western painters in the United States.**

He started remembering the farm days of his youth in South Dakota when he went to Indian reservations on cattle-buying trips with his Dad. Suddenly, his main subject, the Indian's life, entered the foreground of his painting. He moved back to the natural Southwest in Arizona, and started spending hundreds of hours with the Navajo, Hopi, and the Zuni.

But for six years he still depended on his training as an aeronautical engineer to support him before he could firmly establish himself as an artist.

In the begining, Ray showed his work in his own gift store and priced the paintings at $25 to $75. Now he has won the Silver Medal in the National Academy of Western Art Watercolor Show in 1974, the Franklin Mint Gold Medal for Western Art in 1974; and, the Tuscon Festival Artist of the Year Award in 1979. There is no doubt that after twenty years of intense painting activity, Ray Swanson is one of the giants of Southwestern art.

The Navajo are his specialty. "The most exciting, stimulating, and challenging paintings I do," explains Swanson, "are portraits of the older Navajo folk. The lines in their faces reflect more than the strength and ruggedness of the land on which they live. They also show the peace within themselves. They have adapted and become part of this rugged country.

"There is color and contrast in everything from their clothes to the land and their way of life. **But the real challenge for me as an artist is capturing the emotions reflected in their faces.** It may be the compassion, for example, of an old squaw trying to save the life of an orphan lamb, not only for the lamb's existence, but also for her own, because as a people they are dependent upon their livestock for subsistence."

Ray says that now his painting is an everyday - all day devotion. He has made friends with the Indians over the years, sometimes even spending weeks at a time on the reservation. There he has noticed many of the old customs are being dropped as new and more "modern" ways are adopted. It is Ray's plan to capture as much of the disappearing Indian life style as possible before it is gone forever.

His Indian friends notify him for all special occasions - whether it is a fair, a festival, or a sheep shearing. To them Swanson is the chronicler of the Southwest Indian. For someone who never used to think of becoming a painter, Ray now startles even himself, when he realizes, "I can never be free from painting."

The artist's studio and house in Prescott look out on "the fantastic Arizona sunsets against the mountains." Ray's wife, Beverly, handles the business while their adopted children, Pamela and Stephen, accompany their father on his visits to Indian reservations.

Ray Swanson now realizes he is working on a long family tradition of natural talent and a love of the land. And like his grandfather, he plans to pass it on.

1.

2.

3.

4.

1. "Spring Sheepshearing" 1980 (40"x54") oil

2. "A Bit Bashful" 1978 (18"x24") oil

3. "All In A Day's Work" 1979 (28"x46") oil

4. Ray Swanson not only paints the Indians, he studies their culture, language, artifacts - hoping in his own way to help preserve a lifestyle.

Northrop University into the 60's

"Change"...Webster defines it as "an absence of monotony and stagnation." Perhaps of all words this best describes the decade of the sixties at Northrop University. It was a time of audacious causes, new ambitions and bold thinking. People started believing in the possibility of change, not only in social values and human understanding, but in man's belief in new realities discoverable through technology.

With the inauguration of a bold young leader, John F. Kennedy, a transformation was to occur that would propel the country far into the 21st century. What was once dismissed as science fantasy now had the credible support and research dollars of the President of the United States. He pledged to put a man on the moon--and so we did.

As professor of Engineering, John Porter, recalls, "It was an exciting time at Northrop University. The Russians had really caught us by surprise by putting Sputnik into orbit. And so the race for space was on. I remember that we saw a dramatic rise in the number of returning A&P graduates who wanted to further their education in Aerospace Engineering. To tell you the truth, I've never seen the enthusiasm of the students higher."

"We started a Moon Watch Program, comprised of 399 other such amateur stations, basically a student project. Well, after the Russians launched Sputnik, we were contacted by Washington daily. It appeared that they found the Moon Watch Program the only way of constantly tracking the whereabouts of the satellite. Now of course they have sophisticated tracking systems all over the world. But for the time Northrop University was in the paper daily and we were in almost constant contact with Washington."

As student life went in the sixties, Porter recalls, "Well, with all the student political activism going on throughout the country, Northrop had nil in comparison. Being engineers we were rather stodgy and slow to change. I was really dissapponted that students didn't get involved in national issues. Rather, they had little to find fault with at Northrop University so they picked at little things like the food in the cafeteria. They started a student underground newspaper, probably because every other school in the nation had one. It died out very quickly."

"I must say, however," continued Porter, "I have never seen the student and faculty interest so high. We were in two buildings which have since been torn down and we could do amazing things. Whatever the project, we would just move things around and find space; whatever the cost, we would put it together with bits and pieces."

Professor Porter's perceptions of student and faculty enthusiasm proved well-founded as the University staff underwent a major development program to provide

Moon Crew

Northrop in the News: Dr. Johann Arbocz, center, assistant professor at Northrop Institute of Technology in 1969, demonstrates problems in structures for space vehicles on "**Campus Digest**," on Channel 5.

necessary funds for the now constructed Engineering Building and Alumni Library. Although not constructed until 1970-71, the majority of the funds were cultivated throughout the Engineering boom in the sixties.

Many student groups emerged during this space boom. Northrop University students held on of the strongest chapters in the Pacific Rocket Society and later led the nation in the American Rocket Society.

Northrop U's administration had forseen the Engineering boom and had added curriculum designed around Aeronautical and Electrical Engineering and a variety of other courses to equip young minds with the race for the stars.

With the successful landing of Apollo 12 on the Moon, man's greatest achievement had been realized.

Scientists agree that the research accomplished in the NASA Space program during the 60's pushed medical technology ahead by 20 years.

Student "Fling"

Student project "Gyro Copter" is proudly displayed by Alpha Eta Rho Society.

Faculty Advisor Professor Krammer meets with students from American Rocket Society.

With the moon mission safely completed, the country turned its attention to more pressing social and economical problems. The engineering boom that realized man's greatest achievement, turned into what many call man's greatest tragedy. As Melvin Miles, A&P instructor for Northrop University describes, "I was working for Rockwell on their Missile Rocket Program. It was a sad day in the Engineering Industry. I'll never forget it. It is still called "the black year." In October 1968, the same people that helped put the first man on the moon were now jobless. At Rockwell alone, 61,000 were laid off in one day. Many never recovered."

This type of dramatic setback in the Engineering industry had the same effect at the Northrop U. campus. What was once one of the strongest programs virtually dwindled to no supportable levels. However, the aviation Industry recovered its growth by the introduction of the Boeing 707 Jetliner in the late 50's. Through its fuel and cost efficient transportation cost, businessmen realized that cargo and freight could be expedited at incredible time and cost savings.

From this dramatic increase in cargo and freight shipment, thousands of aviation-related companies grew into what are now major aviation freight industries. Many Northrop graduates "branched out" into management and executive positions requiring the basic "nuts and bolts" knowledge of what the aviation industry is all about.

Northrop University throughout its long history of academic excellence indeed survived the plunge of the sixties and continued to provide industry with graduates capable of providing the technical leadership needed to bring into being many of the revolutionary advancements promised for the 70's.

Completed in June, 1966 the James L. McKinley Residence Hall was named in honor of the University's Co-founder and President Emeritus. Built with 2.5 million dollars, the 95 foot building housed 623 students and was the tallest building in Inglewood.

NU Lands $90,000 Contract

Consumer Solar Hot Water Heaters To Be Developed

It's called the Polaris Solar Hot Water Heating System and it is the reason Northrop University will receive $90,000 over the next 12 months from the Gas Research Institute. The Institute, located in Chicago, put out an RFP (request for proposal) a year and a half ago regarding the creation of a very low cost energy-efficient way to supplement gas hot water heaters using Solar Energy. Northrop University along with professors, Drs. David Pelka and Lawrence Eytel, put in their proposal. Four months ago they received notification that NU was to get the contract on the development of this specific hardware.

According to Dr. David Pelka, Chairman of the Physical Science Department and Director of the Energy Research Center at NU, "We think we can greatly simplify the mechanical aspects of the hot water heating system."

Up to this time a number of people and a number of corporate organizations tried to create low cost solar hot water heating systems. The best they've been able to do monetarily is in the neighborhood of $2,000 to $2,500. But this really hasn't met with much marketing acceptance. Says Pelka, "Even in California, which has the most generous tax break of any state, you only get 55% of that money back on your taxes. So, it still means people are paying a thousand dollars for a solar hot water system when they could be paying $200 to $300 for a new hot water system from say, Sears." The retail estimate on the Polaris Solar Hot Water Heating System will be $600.

The year long program calls for the building of a prototype model and the thermal testing of it to see how efficient it will be.

Concerning the initial structure, Dr. Pelka explains, "There is a concentrator across the top of the structure which focuses the energy down into it like a strip. Then, there is insulation completely around the tank and a shroud around that and the whole thing rotated to follow the sun during the day. Now, the system we are proposing here is centered around a regular gas hot water heating tank so it will be vertical. Around that is going to be a rotating shroud that is going to attract the sun. A polymorphic cover is a new type of solar concentrator that we've developed and it will focus the energy down to a very small slit, perhaps two slits. The outside of the rest of the tank will be insulated so as the sun comes up in the morning the concentrator will be pointed at the sun and rotate. It will follow the sun during the course of the day and then rotate back into its morning position."

The tank will be outside so typically it will be placed on the south-facing portion of a person's residence and will be applicable to all residential and commercial applications. "It will lose less heat during the course of the 24-hour period than the normal hot water tank in your house today," according to Dr. Pelka.

"We think we have a very good chance of making it a very low cost hot water system that would be applicable for say a family of four, and it would supply somewhere in the neighborhood of 60% to 80% of their hot water heating. I am going to supply 100%, but if you have a number of cloudy days, people taking a lot of showers, etc. then you always have the regular gas back-up water heater which would come on and heat the water." The tank will probably be around six feet tall and made from weather proof material.

"Remember," adds Pelka, "This is just a prototype unit and one of the things we're going to be doing is testing the unit. The actual manufacturing will occur about four or five months into the program. We'll spend three months testing the thing, seeing how hot the water gets, how quickly the water heats up and how good are the mechanical parts that are put in to track the sun. Those parts will then be subject to dust, wind and rain to see how they hold up to the environment. Also, we will test for corrosion and of course there will be some problems that we haven't foreseen.

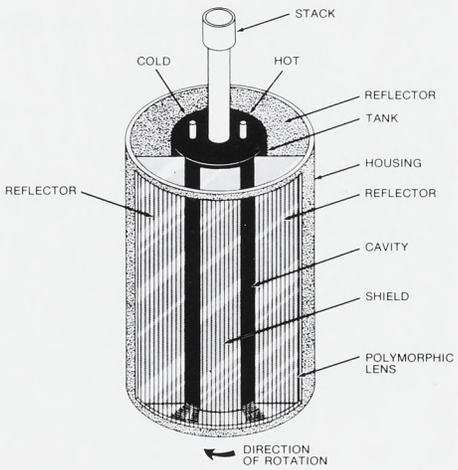

Diagram of Polaris Solar Hot Water Heating System which is centered around a regular gas hot water heating tank.

"People are still paying a thousand dollars for a solar hot water system when they could be paying $200 or $300 for a new hot water system from say, Sears."

"There is a whole lot of work to be done from the time its conceptualized till its actually on the market. So I'd say two and a half years till its ready for the market place. After that we can worry about how we can make it cheaper, the competitive advantage, and who is going to feature it."

The Gas Research Institute's policy is to commercialize the technology (product) that it sponsors at the earliest practical date, so this product, Polaris, should be made available to the world in a few years.

Thanks to Alumnus Skip Metheny A & P '77, the aviation maintenance coordinator for superstar Kenny Rogers, Northrop University is now the proud owner of a biz-jet DeHaviland 125. Skip suggested that Kenny Rogers donate it to Northrop U. as a tax write-off after extensive corrosion in the wings was discovered. Grounded as it is, the jet still provides an excellent learning tool for aviation maintenance and repair on state of the art equipment since its Viper 520 engines are in good condition.

As Skip happily pointed out, "I just couldn't see them donating the aircraft to an orphanage as they had planned. I had to tell them about the aviation technician school right here by the airport."

Now Northrop University has its own $800,000 jet and Kenny Rogers has a new, slightly larger, 75 passenger jet aircraft to take his band on tour.

This Spring Commencement, Ernest W. Hahn, prize-winning builder/developer of shopping centers, will be presented with an Honorary Doctorate in Engineering from Northrop University. Mr. Hahn co-founded the Hahn-St. John Construction firm in 1946 after leaving Northrop Aircraft, Inc., where he served in executive capacity. Hahn-St. John became Ernest W. Hahn, Inc. in 1956 and has since grown to become one of the largest developers of regional shopping centers in the United States.

Royal Malaysian Air Force at Northrop University

A large contract between Northrop University, and Vinnell Corporation and the Royal Malaysian Air Force has brought 500 young men into the Institute of Technology for training, since 1979.

According to Tom August, special projects coordinator for Northrop University, "Vinnell contracted to do the training for the RMAF and we were one of the schools selected; but there are several schools involved in this project."

This training contract brough 105 students to Northrop in 1979, 200 students in 1980, and will bring up to 200 students maximum in 1981. The students arrive in increments of 20 to 25 and as such do not graduate together in a large class. The program lasts for 55 weeks and graduating students are sent home every four to six weeks.

Says Joe Miles, Director of the Institute of Technology, "The RMAF students have established a reputation with the faculty and student body as a no-nonsense, dedicated group willing and ready to accept the responsibilities and requirements of the program. Their attendance, sincerity and professional attitude exemplify the high standards and traits of character desired in our student body. Their academic progress in the school has been highly satisfactory and I would like to compliment the students on their conduct and high level of cooperation."

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Counterpoint

Nuclear Reaction

An alternate viewpoint on the use of Nuclear Energy.

By Allen G. Barclay
Class of '47

The Scope of Nuclear Power

Many people do not realize that nuclear power is already a major source of electric power in both the U.S. and in the rest of the world.

In early 1980, there were 71 operating nuclear power plants in the U.S.[1] These plants currently provide better than 12% of the nation's electric power. At that time, there were 118 additional plants ordered or under construction, which will bring the U.S. total to 189 operating nuclear power plants. Some states, such as Maine, now obtain a major portion of their electric power from nuclear power plants.[2]

Worldwide, there were 229 plants operating in early 1980.[3] This means that there are currently more than twice as many nuclear units operating outside the U.S. as within the U.S. Another 301 nuclear units are ordered or under construction, which will bring the total to at least 530 nuclear units worldwide. France and Belgium expect that almost half of their electric power will be generated by nuclear power by 1985. Japan has the world's second largest installed nuclear capability, and has ambitious plans for continued expansion of that capability.

Obviously, nuclear power plants are neither experimental rarities nor are they unique to the U.S.

The Atomic Explosion Specter

Although both the news media and the anti-nuclear advocates probably know better, they have continually used illustrations and inferences that associate commercial nuclear power plants with atomic explosions. As an example, a cartoon on the editorial page of a major San Francisco Bay Area newspaper, just prior to the voting on the anti-nuclear Proposition 15 in 1976, depicted an atomic explosion at the nuclear power plant wiping out the City of New York.

The truth is that since the fuel used in commercial nuclear power plants contains less than 5 percent fissionable

material, it would be impossible to have an atomic explosion even if you were to design and operate the plant with the objective of producing an atomic explosion.[3] The situation is analogous to trying to produce an explosion with a mixture of 5 percent gunpowder and 95 percent sand.[4]

The Sea (of Radiation) We Live in

Most people are not aware that mankind has always lived in a sea of natural radiation. The sky, ground, our foods, and even our bodies are now, and always have been radioactive. The dosage of this radiation is measured in "millirems" or "mrem," which is a measure that takes into account the biological effects of each of the different types of radiation. Each type of radiation has the same biological effect whether it is emitted by a natural source or by a man-made source of radiation.

Many factors affect the amount of natural radiation to which each of us is exposed. As shown by the following data, where you live can have a big influence.

Aiken, SC	52	mrem per year
Dallas, TX	53	
New Orleans, LA	75	
Reno, NV	79	
Salt Lake City, UT	88	
New York, NY	93	
Denver, CO	107 to 157	
Rolesville, NC	175	

There are places in India and Brazil where the natural radiation level reaches 1500 mrem per year, mostly due to radioactive minerals in the soil, without measurable effects on the population.[4]

The following values are provided as a basis for comparison:

One transcontinental round trip by jet	4 mrem
Year at boundary of nuclear power plant	5*mrem
Chest X-ray	20
Annual average for each U.S. resident	211
Gastrointestinal X-ray examination	2000

***5 mrem per year is the maximum permitted level for design basis. Actual measured values are usually about 1 mrem per year.**[14]

The type of buildings you work in and live in also affect the amount of natural radiation you receive. For example, typical radiation doses received from your house varies from a low of 30 mrem per year for wood to as much as 100 mrem for masonry or brick construction. Because of their granite and marble construction, some buildings like the Grand Central Station in New York City and several federal buildings in Washington exceed the values that would be acceptable for the control room of a nuclear power plant.

Since all of the radiation levels listed above are well below the levels that cause detectable health effects, they are classified as "low level radiation."

Due to variations in natural background radiation levels in different locations and the varying amounts of medical irradiation for different persons, an exact average for sources of radiation is difficult to establish. However, according to two different studies, one American and one European, the typical radiation to which people are exposed comes from the following sources:

	European	American
Natural backround	67.6%	89.4%
Medical irradiation	30.7%	9.0%
Other sources	1.5%	1.4%
Nuclear industry	.2%	.2%

Genetic Damage

During the period of intense TV coverage of Three Mile Island, there were frequent references to the fear of genetic damage from radiation. In some cases, that fear was related specifically to the accident at Three Mile Island. In other cases, that fear was related to nuclear power in general. Actually, during the accident at Three Mile Island, the radiation emitted to the public was miniscule compared to the sea of natural radiation in which mankind has always lived.[7]

There have been many innuendos that genetic damage is a great hazard

of low level radiation and that this is a subject about which little is known. Actually, there is a great volume of published information on this subject. Some of this information is based on radiological events or conditions involving people. For instance:

1. If there were perceptible genetic changes wrought by even the low levels of radiation from nuclear power plants, then there would have to be very significantly higher rates of defective children born in places with high natural radiation levels, like Denver, compared to places with low natural levels, like Dallas.[4] The difference between the natural radiation in those two areas is more than ten times the increased level of radiation at the perimeter of a nuclear power plant. There is authoritative data which shows that there is no measurable difference in the number of defective children born in areas having very different levels of natural radiation, even including areas in India and Brazil where the radiation level is about fifteen times the average natural radiation level found in the United States.[8]
2. When John R. Spalding of the Los Alamos Laboratory in New Mexico started exposing mice to radiation in 1956, he was pretty well convinced that he would find some genetic effects. At the end of the 22-year study, which spanned 83 generations of mice, he still did not see any genetic effects.[9]

Plutonium Toxicity

Plutonium has been branded in the popular news media as the most toxic substance known to man.[4] This claim is often supported by the statement that just a few ounces of plutonium, if properly distributed, could wipe out all of mankind. There is ample scientific basis for refuting these melodramatic claims.

Although plutonium is toxic due to its radioactivity and must be handled with great care, there are many substances that are more toxic. Several of the heavy metals, such as cadmium fumes and mercury vapors, are much more toxic when inhaled than plutonium. There is no known mechanism for oral doses of plutonium to cause early death other than with truly massive does. There are many other substances such as selenium oxide and potassium cyanide, of which only small oral doses will invariably result in death within a short time.

Plutonium particles in the lungs do pose a significant hazard of lung cancer in a period of 15 to 45 years after inhalation. But the contention that just a few ounces could wipe out mankind seems to be a bit of an overstatement when compared to these facts:

1. About 30 years ago, several tons of plutonium were distributed to the atmosphere by nuclear weapons tests. Most of this material has now settled to the earth's surface. As a result, everyone has accumulated small but measurable burdens of this plutonium without apparent ill effect.[4]
2. Twenty-six plutonium workers in Los Alamos who carried measurable burdens of plutonium in their lungs for over 30 years have remained in good health, except for one who died in an automobile accident and another who died of a heart condition.[4]
3. Workers at Rocky Flats who acquired up to ten times the allowable lung burden of plutonium did not show any effects nine years later. Although that time span is too short to incur lung cancer, their continued good health certainly does not endorse the "most toxic substance" claim.[11]

None of these facts justifies any carelessness in protecting the public or nuclear workers from the dangers of plutonium. This information is presented to illustrate that we should not let unjustified and overdramatized fears scare us into not realistically evaluating a viable source of energy.

The Safety Issue

All forms of power generation, including nuclear power, are not without hazards.

In both coal and nuclear power, the greatest risk is in the mining end of the business. A number of studies have indicated that coal mining will probably result in eighteen to fifty times as many fatalities when compared to uranium mining for the same power production.[4] (It takes about 100 times as much coal as uranium ore to produce the same power.) A report by the American Medical Association (AMA) Council on Scientific Affairs in 1978 concluded that a coal-fired power plant is likely to result in 48 to 285 times more deaths each year than an equivalent nuclear-powered generating station.[12] That AMA report included both occupational and non-occupational deaths, including mining. The possibility of the loss of life due to a nuclear accident at a nuclear power plant is a miniscule element in the results of this study, which is consistent with the fact that no such accident has ever occurred.[12]

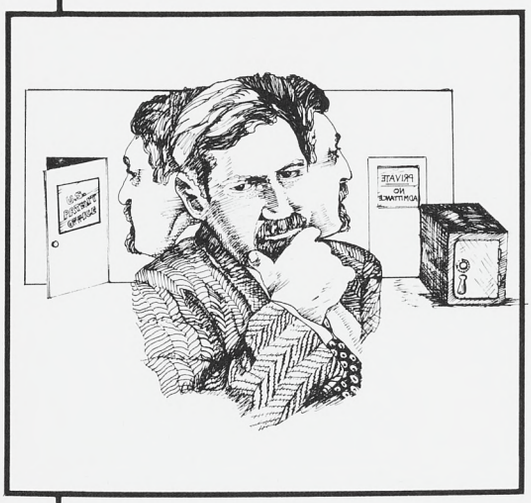
Comparative ratios on the number of lives lost in the production, transportation, and storage of oil for power generation are not readily available, partly because most oil is used for other purposes, such as for transportation fuel. There is however, ample evidence in the headlines that there are many lives lost in drilling rig disasters, tanker fires and sinkings, and storage tank fires. Since no lives have been lost to nuclear accidents in commercial nuclear power plants, the only comparison possible must be based on statistics. Statistically, an oil fire that takes lives is many times more likely to occur than a nuclear accident that could take the same number of lives. (Besides, if oil were a viable way of meeting our long-term future energy needs, we might not even be considering coal and nuclear power.)

Our final safety issue is consideration of the hazards to the public from a nuclear accident. In spite of the dramatization of the events at Brown's Ferry and Three Mile Island, not only were no lives lost, but those who objectively analyzed those events know that both of these events were a long way from threatening any loss of life among the public.

A nuclear power accident taking 1,000 lives is estimated to have a probability of occurring once in a million years.[3] Compared to the loss of over 4,000 lives each year in the production and transportation of coal, why would anyone making an objective analysis propose coal power as a safer alternative than nuclear power?[4 (13)]

Alan G. Barclay (AET '49) was in the first Engineering class to graduate from Northrop University (then the Northrop Aeronautical Institute) and holds a BSIE from Lehigh University. Prior to his current position with a company in the commercial nuclear power industry, he spent 25 years in the aerospace industry and held management positions in engineering. His primary areas of responsibility have been in design control and engineering systems and administration.

Footnotes (1) "Industry Report: 1979-80," Nuclear News Buyers Guide, Mid-March 1980, pp 23-38. (2) Info. No. 147, Atomic Industrial Forum, Inc. (AIF), Oct. 1980. (3) Executive Summary, Reactor Safety Study (WASH—1400), vs. Nuclear Regulatory Commission, Oct. 1975. (4) Peter Beckman, "The Health Hazard of Not Going Nuclear, "The Golem Press, 1976. (5) "Radiation — A Fact of Life," International Atomic Energy Agency, Sept. 1979. (6) Electric Power Research Institute (EPRI) data for congressional committee. (7) "Population Dose and Health Impact of the Accident at the Three Mile Island Nuclear Station," by Ad Hoc Population Dose Assessment Group, May 10, 1979. (8) Science, August 22, 1980, Vol. 209, No. 4459, pp877-880 (9) Info. No. 137, AIF, Dec. 1979 (10) Health Physiscs, Oct. 1979, Vol. 37, No. 4, pp 445-485. (11) Dr. Charles R. Richmond, "Hot Particles and Human Health Effects From Plutonium," (testimony presented to Joint Committee on Atomic Energy, Subcommittee to Review the National Breeder Reactor Program, June 17, 1975). (12) Journal of the American Medical Association, November 10, 1978, Vol. 240, No. 20, pp 2193-2195. (13) U.S. Congress Office Technological Assessment, "The Direct Use of Coal," (library of Congress Cat. No. 79-600071). (14) code of Federal Regulations, title 10, part 20, (10CFR20), "Standards for Protection Against Radiation."



To Patent Or Padlock

(continued from page 3)

ii. Territorial allocations are difficult to defend. Although no longer per se violations of the antitrust laws, if it appears that the arrangement is one in which competitors are dividing a market, then it would be illegal. If the invention offers its owner such a large competitive advantage that he could not be considered a competitor of his licensee, then it would seem that there would be no violation of the law by virtue of the territorial restraint.[10] Putting it another way, a territorial restriction imposed upon a licensee which, prior to the license, was not a competitor, has been considered "the usual covenant by an owner-licensor of a secret process not to compete with its single licensee in the assigned area and to be free from the latter's interference."[11]

iii. Attempting to fix the price at which the trade secret licensee sells the products or goods produced by or embodying the trade secret would simply be illegal.

iv. Although insistance by a patentee that his licensee not handle competing products could well be an antitrust violation as well as misuse of the patent, for a trade secret licensor to insist that his licensee not take a license on a competitive process might be defended on the theory that he would be preventing his trade secret from being used in an unauthorized way.

11. The grant of a patent avoids the problem of having to maintain secrecy in respect to the teachings of the patent. Much as the question of validity is one of the most litigated issues in respect to patents, so is the issue of secrecy in respect to trade secrets probably the most litigated of all problems relating to trade secrets. The patentee need not be concerned with:

i. the extent to which outsiders know of the secret;
ii. the extent to which employees know of the secret;
iii. measures taken to guard the secret;
iv. relative ease by which others can acquire the secret.

12. Patent protection allows employees to publish, gain recognition, and maintain a higher morale and also enables the company to gain valuable publicity and obtain necessary capital as well as facilitating and improving the company's position in cross-licensing, licensing and assigning technology.[12]

13. In enforcing his rights, a trade secret owner must not only identify the end product manufactured, but also supply sufficient data concerning the process, without revealing details of it, to give both the court and the defendant reasonable notice of the issues which must be met at the time of trial and to provide reasonable guidance in ascertaining the scope of the discovery.[13] These requirements pose serious threats for the owner of the trade secret, particularly in maintaining secrecy.

14. To obtain a patent for an invention that can be internally used in a competitor's or customer's plant, thereby preventing detection of infringement, would seem to remove the primary incentive for obtaining the patent to begin with.

15. If someone else comes upon the secret and establishes that the first owner has suppressed or concealed the invention, he may, by virtue of our patent laws,[14] obtain a patent.

16. If the protection afforded by the patent is such that it could be easily designed around by others thus enabling competitors to commercialize the basic concept, then it would seem wiser not to obtain the patent.

17. Under our patent laws, an inventor will forfeit his rights to patent if he does not apply within one year after the invention was "in public use or on sale".[15]

18. As the law presently is, once contracted, the licensee is bound to pay royalties on the licensed trade secret for the life of the contract. If the trade secret becomes part of the public domain, even in absence of any fault on the part of the licensee, it is still apparently the law that this does not relieve him of his contractual obligations.[16] Expiration or invalidity of a patent, however, does relieve the licensee of the obligation to continue the payment of royalties. For the patentee to continue the collection of royalties thereafter would expose the patentee to antitrust consequences.[17]

19. It does not appear that the grant of a simple license under a patent, without more, could lead to third party product liability. By virtue of their statutory nature, patents are addressed to those skilled in the art; they are not issued on the basis of the safety, effectiveness or reliability of the disclosed technology.[18]

20. With respect to the licensing of trade secrets, the act of delivering the trade-secrets, the licensor's experiential expertise, and the licensor's other involvements with the licensee's operations appear to be the basis of potential third party product liability.

A recent article in the **Wall Street Journal** concluded with these remarks: "Uncertain, companies must decide between filing for a patent that could prove weak, and thus being forced to reveal the details of their discoveries, or trying to keep a competitive edge through secrecy and aggressive marketing, much as in the computer industry....Concludes Biogen President Rob Cawthorn: 'We're going to be aggressive in applying for patents, but we don't know what they're worth and we won't depend on them. We'll depend on fast running'."[19]

It is a difficult thing in the abstract to make the determination as to whether to "patent or padlock", to reconcile the claims of the owners of discoveries with the conflicting claims of governmental policies directed towards competiiton and the complexities of competition itself, but specific solutions are always present, given knowledge and forethought.

Footnotes: 1. Globe Ticket Co. vs. International Ticket Co., 90 New Jersy Eq. 605, 1918. 2. Aktiebolaget Bofors vs. U.S., 194 F. 2nd. 145. 3. 35 U.S.C. 112. 4. Patent Law Review, Clark Boardman Co., Ltd., 1974. 5. 35 U.S.C. 293. 6. Lear vs. Adkins, 395 U.S. 653, 1969. 7. Walker Process Equipment Co. vs. Food Machinery and Chemical Corporation, 382 U.S. 172, 1965. 8. 35 U.S.C. 261. 9. "Know How Licensing and the Antitrust Laws", D.R. MacDonald, 62 Michigan Law Review, 351, 1959. 10. U.S. vs. E.I. DuPont de Nemours & Co., 351 U.S. 377, 1956. 11. Foundry Services Inc. vs. Beneflux Corp., 110 F. Supp. 857, 1953. 12. "Strategy for Trade Secret Survival", Philip Sherber, Patent Law Review, Clark Boardman Company, Ltd., 1974. 13. Diodes, Inc. vs. Franzen, 260 Cal. App. 2nd. 244, 1968. 14. 35 U.S.C. 102 (g). 15. 35U.S.C. 102 (b). 16. Warner Lambert Pharmaceutical Company, Inc. vs. John J. Reynolds, Inc. et al, 178 F. Supp. 655, 1959. 17. Brulotte vs. Thys Co., 379 U.S. 29, 1964. 18. "Tort Liability that may Attach to Intellectual Property Licensing", W.R. Norris, Intellectual Property Law Review, Clark Boardman Company, Ltd., 1979. 19. "Right to Life", Hal Lancaster, The Wall Street Journal, Dec. 3rd, 1980.

Chief George Pierre

Ambassador from America to America

It isn't often that an American Indian Chief goes to Law School, writes movie scripts, and becomes a candidate for a Ph.D. in Political Science. But Chief George Pierre has been surprising people for a long time. As Chief of the Colville Confederated Tribes of Washington, he has been adviser to 5,000 Indians on over one million acres of reservation forest and ranch land, as well as serving the State of Washington in their House of Representatives. Part of the reason people are surprised at the achievements of George Pierre is the extraordinary strength he displayed when he returned from World War II partially paralyzed by a gunshot wound and still completed four years of high school work in eleven months of study.

Now, he is listed in **Who's Who in America West**, **Who's Who in American Politics**, **Outstanding Personalities of 1968** and the sixth edition of the **Dictionary of International Biography** published in London, England.

Chief George Pierre was taught from an early age that the life of a Chief would be a hard struggle. The son of a Colville Chief and a Medicine Woman, Pierre was chosen by the Elders of the Tribe to be instructed in the ways of the Chief when he was only four years old. At eight, he was burdened with the responsibility of supporting his family when his father became blind. He has been working at double speed ever since.

"What I remember most about my early training with the Elders is the ancient saying: '**When other people stop fighting and give up, then the Chief must begin to fight.**'" Little did George Pierre, or "Tall Son," as he was called, know that this teaching would give him the stamina he needed on the island of Tarawa in the Pacific when he was wounded in the head and partially paralyzed on his right side. Since he was raised in a culture which says Chiefs have to fight a little harder, he was prepared.

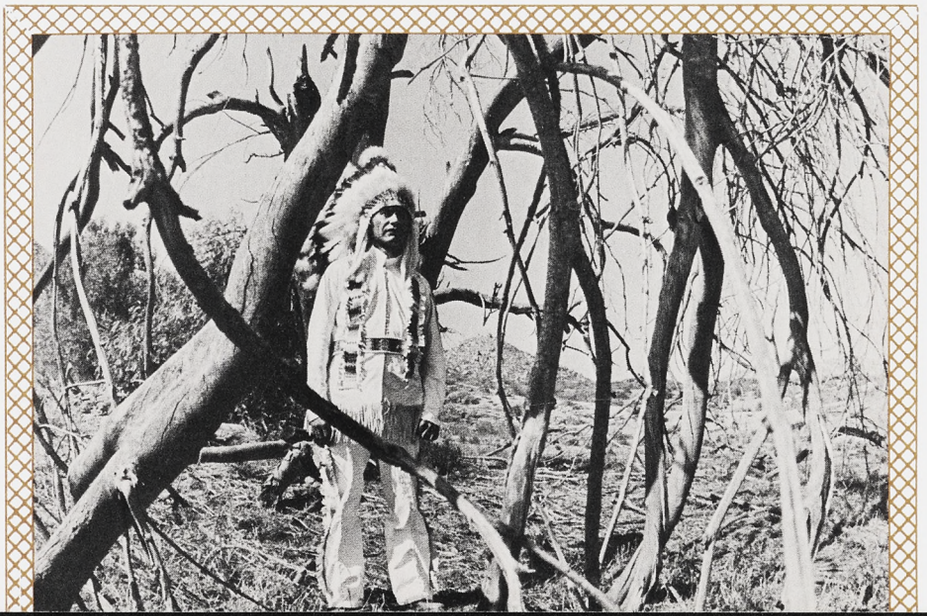
Right now, George Pierre is working on his Juris Doctorate with an emphasis on Constitutional Law at Northrop University and plans to return to the Colville Confederated Tribes as a tribal attorney. "I certainly would charge less for my serevices than the fees the tribes are used to paying," He smiled broadly.

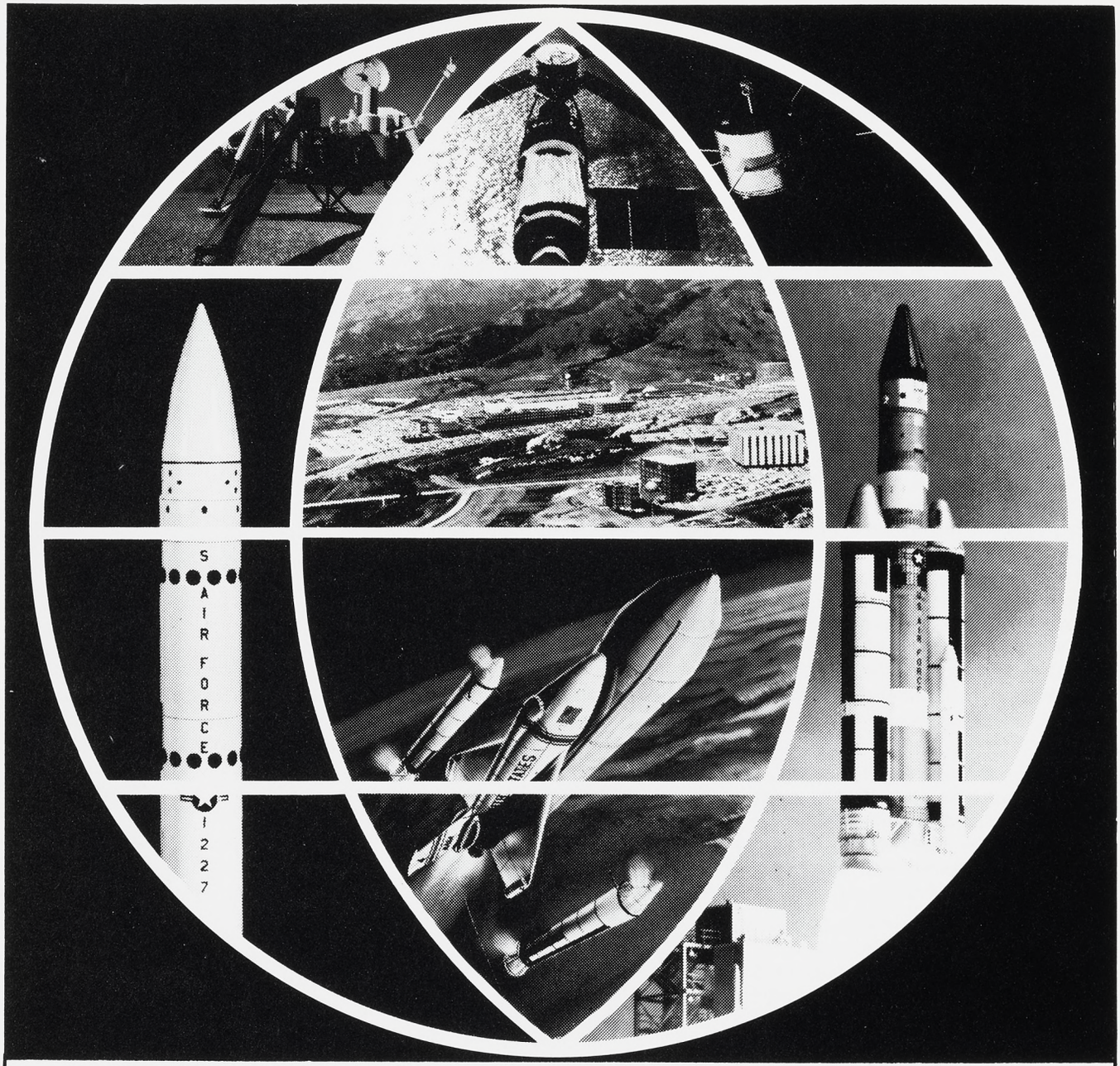
However, as the past National Chairman for the Indian Vote for Reagan, Pierre may be called back to Washington D.C. as Undersecretary for Indian Affairs. If this does happen, he is prepared. "I want to raise the morale of the American Indian by including the entire Indian family in an educational program supportive of young Indians getting into careers," the Chief said.

He also believes that with the Reagan Administration, the Bureau of Indian Affairs will have to be more responsive to the Indian crisis and show measureable results for the amount of money invested in the Bureau's work. "They spend close to $300 million a year building a massive administrative system when there are only 1 million Indians in America today," he explained. "And that's a lot of money being spent to have the average life-span of the Indian still at forty-five."

Acutely aware that the Indian lives under primitive conditions, Chief Pierre has written a first hand account of the problems in his new book, **American Indian Crisis**. In a serious tone, he explains that three fourths of all Indian families on reservations have no source of pure water for drinking. He has taken it upon himself as a life time responsibility to make "all Americans aware of the fact that they have, right here in their own country, a group of people as deprived as those of any under-developed land of Asia or Africa."

No one can be more serious about his life's work than Chief Pierre. And yet, no one can be more inspiring at a celebration, whether he is in full regalia as a Chief giving honorary tribal membership to Marlon Brando, or hunting permits to Roy Rogers. It is obvious that Pierre enjoys sharing his cultural heritage of music, dance, and folklore. In his dedication to his people, he has become a very successful ambassador as well as an exemplar of unusual character - to all nationalities.





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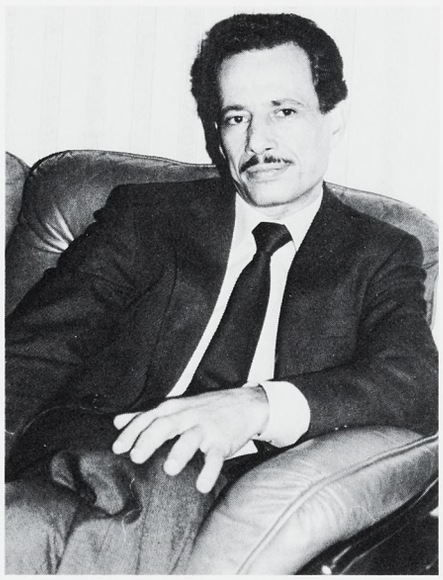
N.U. Alumni Lead at Saudi Arabian Airlines

"Actually, most of the department heads at Saudi Arabian Airlines graduated from Northrop University," says General Manager of Saudia Technical Training, Jamil Temairik, an Engineering Technology graduate of Northrop in 1969.

Shortly after graduation, Jamil started an apprentice program for Aviation Technicians all across the United States. Northrop University is one of the schools working with Saudi Arabian Airlines to produce 2,500 qualified aviation mechanics within five years.

On his recent visit to the campus, Jamil revealed that Saudia has grown from 2,500 to 21,000 employees in 10 years and flies to the Far East as well as Europe. The United States wil see Saudi Arabian Airlines when they begin landing in New York early next year.



Mohammed Jamil Temarik, General Manager of Saudi Arabian Airlines, Technical Training and N.U. graduate in 1969.

Other Northrop Universitygraduates at Saudia are Adnan Dabbagn, Vice President of Technical Services; Sulman Koshy, Assistant Vice President of Technical Services Support; Hisham Bakheit, General Manager, Facilities and Ground Support; Swaileh Al Jofi, General Manager Maintenance and Planning; and Ahmed Sharbi, General Manager, Engineering and Quality Control.

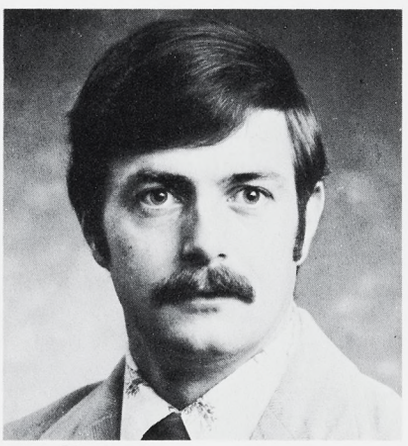
Michael Rinaker Promoted

Aeroquip Corporation's Gustin-Bacon Divison announced the promotion of Michael J. Rinaker to the position of sales coordinator, Marman Industrial Products.

A native of Roseburg, Oregon, Michael Rinaker graduated with an Associate's degree in Aircraft Maintenance Technology from Northrop Institute of Technology in 1975.

Mr. Rinaker joined Aeroquip in1976 in the customer service department for the company's Marman plant in Los Angeles In 1978, he transferred to the Aeroquip Aerospace Division's Jackson, Michigan plant, where he served in a similar capacity.

Aeroquip Corporation has plants in 14 U.S. states and 12 countries worldwide, producing hundreds of products for use across all industries. Headquarted in Jackson, Michigan, Aeroquip is a subsidiary of Libbey-Owens-Ford Company.



Mike Rinaker

Alumni Directory Nears Completion

All telephone contact has been completed by Bernard C. Harris Publishing Company, publishers of our official alumni directory. The purpose of the telephone contact was to verify the information which the alumni provided on the directory questionnaires and the information currently held on the alumni records.

At the same time, the telephone representatives of the publishing company invited alumni to purchase personal copies of the directory as well as place advertising in the volume.

The directory is tentatively scheduled for release in early March. If you have not received your copy by April 1st, or you are interested in ordering a copy and have not heard from the publisher, you may contact them directly at 170 Hamilton Avenue, White Plains, NY 10601.

Defense Program for Industry

The U.S. Department of Defense, Office of the Under Secretary for Research and Engineering is considering a new program to increase the participation of small businesses in defense-related innovative high-technology research and development. A source list of small, high-technology business firms is now being compiled for future mailings of program information. If your firm is interested in receiving this information please write to:

Mr. Hal C. Felsher
Director, Small Business
& Economic Utilization
Policy Office
Under Secretary of
Defense for Research
& Engineering
Room 2A 340
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National SAFE Award Given Northrop Grad

This spectacular aircrew escape which allows ejection from an aircraft flying upside-down at 100 feet above the ground was developed by the Naval Weapons Center and received the top National Award and Honor given each year by SAFE (Survival and Flight Equipment) Association.

Northrop University alumnus, Gene R. Drew (B.S. in Aeronautical Engineering '62) received the honor in 1979 as part of the Naval Weapons center team for his part in the development of the first "Vertical Seeking Ejection Seat" in a 175 degree roll.

The ejection system should significantly reduce the fatalities resulting from aircraft ejection by rocketing the pilot's seat vertically until it is a safe height before parachuting it back to earth.

Gene R. Drew (BSAE '62) on left, receiving congratulations for his SAFE Award from R.M. Hillyer, Technical Director of the Naval Weapons Center.

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